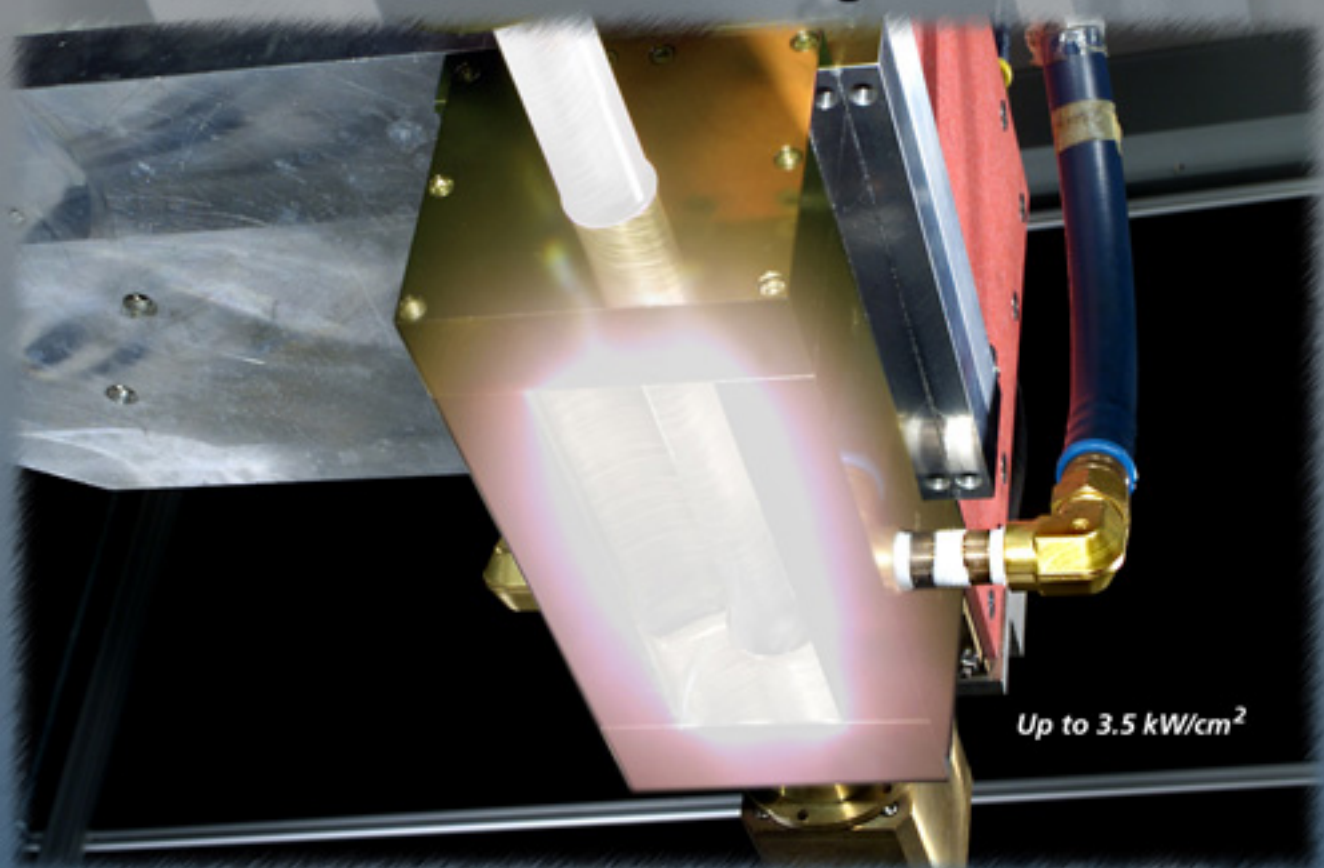
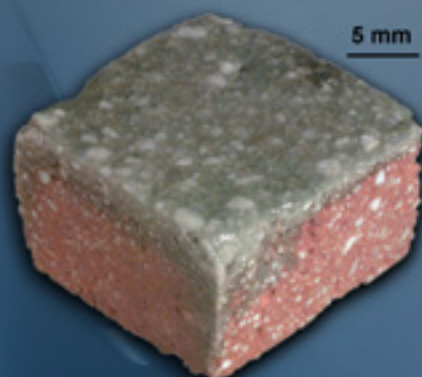


Plasma Infrared Processing of Materials



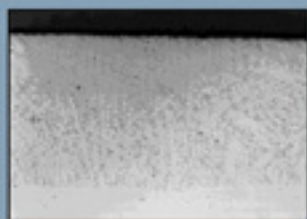
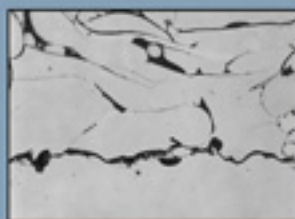
Up to 3.5 kW/cm²



5 mm

*Flame sprayed Ni-20Cr
hardfacing coating*

*After plasma
infrared fusing*



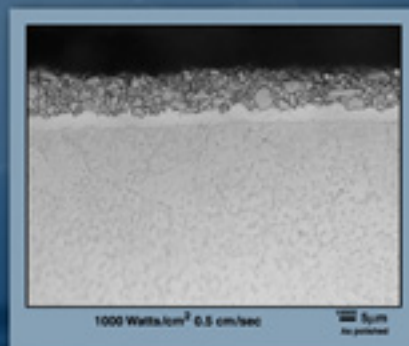
100µm

*Fused surface on
mullite refractories*

Research performed at



OAK RIDGE NATIONAL LABORATORY



*Fused WC/Ni coating
on 4340 steel*



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Plasma Infrared Processing of Materials

A high-density-infrared, transient-liquid coating process has been developed to produce wear- and corrosion-resistant coatings on a variety of surfaces that are of commercial interest. The process combines plasma infrared heating with power densities up to 3.5 kW/cm^2 with a room-temperature spray process to quickly form wear- and/or corrosion-resistant coatings in seconds. This process has been demonstrated using Cr_2C_3 and WC-reinforced coatings with nickel-based binders. Coating densities as high as 98–100 percent of theoretical density have been achieved with coating thickness of 10 μm to 2 mm. The same processing techniques have also been shown to be capable of performing localized and selective heat treatment of surfaces.

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